

person of ordinary skill in the art without departing from the scope of this invention.

WHAT IS CLAIMED IS:

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comprising

steam or chemical

delivering said antimicrobial gas into said section for a duration, at a temperature, and in an amount sufficient to kill microorganisms and sterilize the section, and

returning said sterilized section in the system to operation.

1. The first step is to identify the problem or goal.

2. The method of claim 1 further comprising the step of purging said antimicrobial gas from said sterilized section in the system with sterile gas.
3. The method according to claim 1 or 2 further comprising charging said sterilized section in the system with sterilized water.
4. The method of claim 1 wherein said section contains water and comprises removing the water from said section before delivery of the antimicrobial gas.
5. The method of claim 1 comprising maintaining the sterility of the section upon returning to operation.
6. The method of claim 5 wherein a second sterile gas is introduced under pressure into the pipe section to maintain sterility.
7. The method of claim 6 wherein said second sterile gas is selected from the group consisting of filtered air and ultraviolet irradiated air.

8. The method of claim 1 wherein said antimicrobial gas is selected from the group consisting of steam, ammonia, ozone, nitrous oxide, sulfur dioxide, sulfur trioxide, vaporized alcohols, vaporized aldehydes, chlorine, bromine, oxygen, vaporized formaldehyde, and
5 ethylene oxide.

9. The method of claim 1 wherein said antimicrobial gas is a heated gas.

10. The method of claim 9 wherein said heated gas is selected from the group consisting of ~~steam~~, nitrogen, air, an inert gas, and combustion gas, and mixtures thereof.

11. The method of claim 9 wherein said section includes a plurality of heat-sensitive sprinkler heads and comprising inactivating the heads for the delivery of the heated gas.

12. The method of claim 11 comprising removing said sprinkler heads and replacing them with temporary fittings for closure of said section during the heated gas delivery.

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13. The method of claim 12 wherein each temporary fitting is selected from the group consisting of a valve, a plug, and a condensate trap, or combinations thereof.

14. The method of claim 12 comprising delivery of heated gas through said temporary fitting.

15. The method of claim 12 comprising replacing said temporary fittings after sterilization with sterilized sprinkler heads for operation of said system.

16. The method of claim 10 wherein said section includes a plurality of heat-sensitive sprinkler heads and comprising selecting a gas temperature below the activation temperature of said sprinkler heads, said gas temperature sufficient to kill said microorganisms.

17. The method of claim 9 comprising heating a plurality of said sections by heat transfer from said heated gas.

18. The method of claim 9 comprising utilizing a temperature sensor to determine temperature at a position in said section of the system.

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20. The method of claim 9 wherein the said gas temperature is between about 100°C to about 140°C.

22. The method of claim 1 wherein said antimicrobial gas is steam at least about 120°C at a pressure of at least about 30 psi for at least about 5 minutes.

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23. A method for thermally sterilizing a fire sprinkler system comprising

isolating a section of a water distribution pipe in a fire sprinkler system for the delivery of steam, wherein said water distribution pipe includes a plurality of heat-sensitive sprinkler heads and contains
5 water,

removing the water from said section of the system,

utilizing a temperature sensor to detect the temperature at a position in said section of the system,

10 inactivating the sprinkler heads during the delivery of the heated gas by removing said sprinkler heads and replacing them with temporary fittings,

delivering said steam into said section for a duration at a temperature and in an amount sufficient to kill microorganisms and
15 sterilize the section, and

returning said sterilized section in the system to operation.

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24. The method of claim 23 further comprising the step of purging said steam from said sterilized section with sterile gas.

25. The method according to claim 23 or 24 further comprising charging said sterilized section in the system with sterilized water.

26. The method of claim 23 comprising maintaining the sterility of the section upon returning to operation.

27. The method of claim 24 wherein a second sterile gas is introduced under pressure into the pipe section to maintain sterility.

28. The method of claim 27 wherein said second sterile gas is selected from the group consisting of filtered air and ultraviolet irradiated air.

29. The method of claim 23 wherein said temporary fitting is a valve, a plug, or a condensate trap, or combinations thereof.

30. The method of claim 23 wherein the temperature of said steam is between about 100°C to about 140°C.

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31. The method of claim 23 wherein said temporary fittings are replaced with sterilized sprinkler heads for operation of said system.

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